

### **REMARKS**

This Amendment, submitted in response to the non-final Office Action dated May 3, 2005, is believed to be fully responsive to the points of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1, 6-10 and 16-20 are pending. Claims 6, 16 and 18 are amended above. No new matter has been added by the amendments.

Claims 1, 8-10 and 16-20 have been rejected under 35 USC 103(a) over US Patent No. 2,982,495 (Griffith), in view of US patent No. 6,637,187 (Sanders). The Examiner indicated that Claims 6 and 7 would be allowable if rewritten in independent form. Applicants respectfully submit the following remarks in support of the patentability of the claims.

**1. Claims 1, 8-10 and 20:**

Claims 1, 8-10 and 20 have been rejected under 35 USC 103(a) over Griffith, in view of Sanders. Claim 1 is directed to an aircraft including at least one airfoil having a leading edge and a trailing edge and a number of pulse detonation engines distributed along one of the leading and trailing edges of the airfoil and positioned beneath the airfoil. Each pulse detonation engine is adapted for impulsively detonating a fuel/oxidizer mixture to generate a thrust force and to apply the thrust force to the aircraft. At least one of the pulse detonation engines is movably configured for altering a direction of the thrust force relative to the airfoil. Claims 8-10 and 20 depend from Claim 1.

Turning to the cited art, Griffith is directed to an aircraft with tiltable lift engines that includes a plurality of gas turbine reaction slave units spaced spanwise of the aircraft wing structure and at least one master combustion engine. (Col. 1, lines 17-30) The aircraft further includes flaps 13 that provide a mounting structure for a bank of slave units 14. (Col. 4, lines 1-6) As noted by the Examiner, Griffith does not teach or suggest the use of pulse detonation engines, as recited by Claim 1. Rather, each slave unit in Griffith comprises a gas turbine engine (Col. 4, lines 13-26).

The Examiner cites Sanders to supply this deficiency of Griffith. Sanders is directed to a rotary inlet flow controller for pulse detonation combustion engines. The Examiner notes that Sanders lists various benefits of pulse detonation engines (Col. 1, lines 26-38). However, Sanders does not teach or suggest the desirability of employing a

plurality of distributed pulse detonation engines, as recited by Claim 1. On the contrary, Sanders teaches that the subject rotary inlet flow controller is particularly suited for a combined engine system, such as a turbojet or a turbofan located in the center of a circular duct with a pulse detonation engine located around the periphery to function as an afterburner. (Col. 3, lines 36-53) Sanders further explains that for this engine system, the turbojet/turbofan engine provides thrust for lower speed conditions up to about mach 2 to 3, and the pulse detonation engine provides thrust for the higher mach numbers after the low-speed propulsion engine has been shut down and isolated from temperature effects at high mach flight conditions. (Col. 3, lines 41-48) Sanders further explains that this invention may also be applied to a combined cycle hypersonic propulsion system, with the rotary flow controller and pulse detonation engine located in the center of a circular duct with a combined ramjet and/or scramjet airflow duct positioned in a wrap-around arrangement. (Col. 3, lines 48-53)

In view of the express teaching of Griffith that the slave units comprise turbine engines and of the express teachings of Sanders that the subject rotary inlet flow controller is particularly suited for combined engine system with a turbojet or a turbofan or for a combined cycle hypersonic propulsion system, Applicants respectfully submit that one skilled in the art would not ignore the teachings of Griffith and Sanders in order to combine the two references in the manner suggested by the Examiner.

In view of the above, Applicants respectfully submit that Claim 1 is patentably distinguishable over the cited art. Further, as Claims 8-10 and 20 depend from Claim 1, Claims 8-10 and 20 are also patentably distinguishable over the cited art for at least the reasons discussed above with respect to Claim 1. Accordingly, Applicants respectfully request that the rejections of Claims 1, 8-10 and 20 under 35 USC 103(a) be withdrawn.

**2. Claims 6 and 7:**

The Examiner indicated that Claims 6 and 7 contain allowable subject matter. Claim 6 has been rewritten in independent form. Claim 7 depends from Claim 6. Accordingly, Applicants respectfully submit that Claims 6 and 7 are in condition for allowance.

**3. Claims 16-19:**

Claims 16-20 have been rejected under 35 USC 103(a) over Griffith, in view of Sanders. Claim 16 has been amended to clarify that the semi-major axis of the outlet is greater than a semi-minor axis of the outlet. Claim 18 has been similarly amended to clarify that the semi-major axis of the inlet is greater than a semi-minor axis of the inlet. Support for these amendments can be found, for example, in FIG. 8. As discussed on page 8 of the present application, this configuration has aerodynamic benefits.

The Examiner pointed to the circular turbine configuration of Griffith to reject Claim 16. However, Applicants respectfully submit that Griffith does not teach or suggest an outlet having an elliptical cross-sectional area with a semi-major axis oriented along the airfoil, where the semi-major axis is greater than a semi-minor axis of the outlet, as recited by Claim 16. Moreover, Sanders does not supply this deficiency of Griffith. Claims 17 and 18 depend from Claim 16.

In view of the above, Applicants respectfully submit that the cited art does not teach or suggest the configuration of Claim 16. Further, as Claims 17 and 18 depend from Claim 16, these arguments apply equally to Claims 17 and 18. Accordingly, Applicants respectfully request that the rejections of Claims 16-18 under 35 USC 103(a) be withdrawn.

Claim 19 depends from Claim 1 and further recites that each of the pulse detonation engines comprises an inlet for receiving oxidizer, an outlet for exhausting an exhaust flow, and a PDE body extending between the inlet and the outlet, where the PDE body has a cross-sectional area that decreases from a larger cross-sectional area at the inlet to a smaller cross-sectional area at the outlet. As discussed on page 8 of the present application, at high altitudes, the low ambient pressure increases detonation cell size. Accordingly, for high altitude applications, it is desirable to restrict the size of the outlet to increase the pressure within PDE body.

The Examiner points to the cylindrical turbine configuration of Griffith to reject Claim 19. However, Griffith does not teach or suggest a PDE body extending between the inlet and the outlet, where the PDE body has a cross-sectional area that decreases from a larger cross-sectional area at the inlet to a smaller cross-sectional area at the outlet, as recited by Claim 19. Neither reference teaches this recitation nor recognizes the above-mentioned problem at high altitudes. Accordingly, there would be no motivation to modify the references as suggested by the Examiner. In view of the above, Claim 19 is

patentably distinguishable over the cited art and withdrawal of the rejection of Claim 19 under 35 USC 103(a) is respectfully requested.

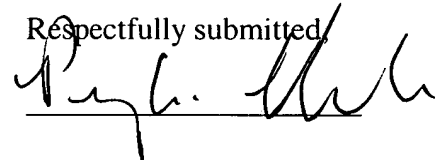
**CONCLUSION**

In view of the foregoing, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

**Please charge all applicable fees associated with the submittal of this Response and any other fees applicable to this application to the Assignee's Deposit Account No. 07-0868.**

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number below.

Respectfully submitted,



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